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EXAMINER

ROGERS, MARTIN K

ART UNIT

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1747

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/579,561	Applicant(s) MARCHINI ET AL.	
	Examiner MARTIN ROGERS	Art Unit 1747	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 December 2011.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 5) ☒ Claim(s) 48-69 is/are pending in the application.
- 5a) Of the above claim(s) 50,53,54,66 and 67 is/are withdrawn from consideration.
- 6) ☐ Claim(s) ____ is/are allowed.
- 7) ☒ Claim(s) 48, 49, 51, 52, 55-65, 68 and 69 is/are rejected.
- 8) ☐ Claim(s) ____ is/are objected to.
- 9) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

1. Claims 48, 49, 51, 52, 55, 57, 58, 61, 63-64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Caretta (EP 0976534 already of record), in view of Roy (USP 4382757 already of record), Scarzello (WO 01/62480), and Drucker (USP 4548050).

In regards to claim 48, Caretta discloses a process for manufacturing a tire (Abstract) in which an elastomeric layer is provided on the outer surface of a toroidal support, the shape of the toroidal support's surface matching the shape of the inner surface of the tire ([0045-0046]). A tire is assembled on the elastomeric layer ([0046]) and introduced into a molding cavity with walls that match the desired shape of the outer surface of the tire ([0013]) such that a working fluid presses the inner surface of the green tire by being admitted to a gap between the tire and toroidal support ([0013]). Before admitting the working fluid to the gap, the elastomer needs to be cured by applying heat ([0079]). Caretta does not utilize a toroidal support with internal protruding elements. However, Caretta discloses that steam is admitted to the interior of the toroidal support to vulcanize the tire assembly ([0080]-[0082]) such that the exterior of the green tires assembly is pressed and molded against the interior of the mold cavity ([0038]-[0042]). Caretta discloses the tire is arranged in the mold such that its rotational axis is vertical (Figure 1) and that steam is introduced into the interior of the toroidal support through conduits that are generally arranged on axially opposite sides of the tire, above and below the green tire ([0041] and Figure 1: 9, 10).

Roy discloses that when using steam to heat the exterior surface of an enclosed space, it is beneficial to provide protruding fins on the interior surface which is in contact with the steam for the benefit of increasing the heat-transfer from the steam (Column 4, lines 50-60). One of ordinary skill would have appreciated that increased heat transfer decreases the required heating time and therefore increases the production efficiency of the process. Therefore, one of ordinary skill in the art at the time of the invention would

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have found it obvious to provide protrusions on the interior surface of the toroidal support of the above combination of references for the benefit of increasing heat transfer through the toroidal support (as disclosed by Roy).

In addition to confirming that improved heat-transfer through a toroidal support is beneficial in a tire-curing process (Page 10, lines 6-8), Scarzello discloses that administering a curing steam to hollow toroidal support from above (Figure 6: 16a) such that it flows axially along the internal walls of the toroidal support (Page 10, lines 20-32) and exits below at the axially opposite side (Figure 6: 16b), it is possible to create a vertical flow of steam within the toroidal support (Page 9, line 25 through Page 10, line 4) that beneficially assists in eliminating steam condensate (Page 11, lines 5-22), increasing the heat transfer (Page 10, lines 2-4), and uniformly cures the green tire through homogenous transmission of heat (Page 10, line 27). Therefore, in order to facilitate the removal of condensate, increase the heat transfer rate, and improve curing uniformity, a skilled artisan would have found it obvious to have the curing steam flow axially along the interior walls of the toroidal support (as disclosed by Scarzello). In order to not disrupt this beneficial axial flow, a skilled artisan would have found it obvious to arrange the heat-transfer fins of the above combination of references axially along the walls of the toroidal support, otherwise they would obstruct this axial direction of flow. The examiner wishes to point out that Scarzello discloses that a rotational motion to the curing steam is optional (Page 10, lines 28-29), therefore encompassing embodiments in which the steam flows completely vertically along the axial dimension of the toroidal support. In addition, Drucker discloses that for heat-exchange fins

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exposed to a condensate, it is beneficial to arrange the fins as vertically as possible so that the force of gravity facilitates the removal of the condensate from the heat-exchange structure (Column 1, lines 46-56). One applying the teachings of Drucker to the above combination of references would therefore find it obvious to arrange the heat-exchange fins directly between the two axial sides of the support so that at the time of curing, the fins are arranged axially and gravity will cause any steam which condenses on the toroidal support to be more easily removed (as disclosed by Drucker).

In regard to claim 49, Roy further discloses that the protrusions be in the form of fins (elongated ribs) (Column 4, line 53).

In regards to claim 51, Roy further discloses that the protrusions extended perpendicularly from the surface of the wall which is in contact with the steam. One applying the teachings of Roy to the toroidal structure of the combination of references would therefore find it obvious to use inwardly protruding ribs.

In regards to claim 52, Roy further discloses that the ribs are obtained in a thickness of the wall material (Figure 8: 79).

In regards to claim and 55, Caretta further suggests to a skilled artisan that any sequence of steps that allows the tire inner liner to be cured before admission of the working fluid to the gap between the tire and toroidal support would be suitable for the

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invention ([0079]). It is considered within the ability of one of ordinary skill in the art to determine a suitable time to perform the pre-curing, provided the precuring occurs at some time prior to the final curing the tire.

In regards to claim 57, Caretta further discloses introducing the working fluid into a diffusion gap ([0013]).

In regards to claim 58, Caretta further discloses that the inner surface of the tire is cured by heating the toroidal support to a predetermined temperature ([0047] and [0077]).

In regards to claim 61 and 63, it is the examiner's position that the pressure used to press on the inner surface of the tire will depend on the size, shape, and composition of the tire as well as the thickness, temperature, and material used for the molding surface. The parameters of the pressure-applying step would have been optimized by a skilled artisan to achieve a desired result, namely sufficient and uniform curing of the specific tire used within a desired timeframe and at a desired curing temperature.

In regards to claim 64, Caretta further discloses using steam as the primary working fluid ([0082]). It is the examiner's position that a skilled artisan would appreciate that the temperature of the working fluid needs to be adjusted based on the size, composition, and shape of the tire. The working conditions of the heat-applying step

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would have been optimized by a skilled artisan to achieve a desired result, namely sufficient and uniform curing of the specific tire used within a desired timeframe.

In regards to claim 65, Caretta further discloses the use of steam.

Claims 56, 59, 60, 62 and 68 are rejected under 35 U.S.C. 103(a) as being unpatentable over the previous combination Caretta (EP 0976534 already of record), Roy (USP 4382757 already of record), Scarzello et al. (WO 01/62480), and Drucker (USP 4548050) as applied to claim 48 above, and further in view of Midgley (USP 1394928).

In regards to claim and 56, Caretta further suggests to a skilled artisan that any sequence of steps which allows the tire inner liner to be cured before admission of the working fluid to the gap between the tire and toroidal support would be suitable for the invention ([0079]). It is considered well within the ability of one of ordinary skill in the art to determine a suitable time to perform the pre-curing, provided the precuring occurs at some time prior to the final curing the tire.

In any event, Midgley further discloses that by partially curing the internal surface of an assembled green tire prior to the vulcanization process, it is possible prevent distortion during the tire curing (Page 1, lines 37-42). Therefore, in order to prevent distortion during the vulcanization step, a skilled artisan would have found it obvious to

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perform a preliminary cure on the interior of the tire after the entire green tire assembly had been created on the toroidal support (as disclosed by Midgley).

In regards to claim 59, Caretta does not disclose pressing the tire against the heated toroidal surface with a secondary working fluid.

Midgley discloses curing the interior of a green tire on a heated rigid support (page 2, lines 99-102). Midgley discloses that skilled artisan would consider it to be functionally equivalent to either heat the tire structure in open air or under an applied fluid pressure (Page 2, lines 15-35). Midgley discloses that compressing the carcass against the rigid support during pre-curing has the additional benefit of creating a more uniform product (Page 1, lines 79-84 and 94-101) (Page 2, line 129 though Page 3, line 2). Therefore, one of ordinary skill in the art at the time of the invention would have found it obvious to perform the inner liner pre-curing on the heated supported required by the previous combination during pressing on the exterior surface with a working fluid because this is functionally equivalent to curing in an open air environment (as disclosed by Midgley). One of ordinary skill would have been further motivated to utilize a working fluid to press the tire against the curing surface for the additional benefit of ensuring the uniformity of the product (as disclosed by Midgley).

In regards to claims 60 and 62, it is the examiner's position that the pressure used to press on the outer surface of the tire will depend on the size, shape, and composition of the tire as well as the thickness, temperature, and material used for the

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rigid support. The working conditions of the pressure-applying step would have been optimized through routine experimentation by a skilled artisan in order to achieve a desired result, namely sufficient and uniform curing of the specific tire used within a desired timeframe and at a desired curing temperature.

In regards to claim 68, Midgley further discloses that the pressing occurs simultaneously with the heating (Page 2, lines 15-35).

Claim 69 is rejected under 35 U.S.C. 103(a) as being unpatentable over the previous combination of Caretta (EP 0976534 already of record), Roy (USP 4382757 already of record), Scarzello (WO 01/62480), and Drucker (USP 4548050) as applied to claim 48 above, and further in view of Smith et al. (USP 5937517).

In regards to claim 69, Roy does not disclose how the integral fins are created, suggesting to one of ordinary skill in the art that any well-known method for creating heat transfer fins would be suitable.

Smith discloses that it is well known in the art to create heat transfer fins by milling (Column 5, line 61). Therefore, one of ordinary skill in the art at the time of the invention would have found it obvious to create the heat transfer fins by milling because this is a well-known method of creating integral fins in a material (as disclosed by Smith).

Response to Arguments

Applicant's arguments with respect to claims 48, 49, 51, 52, 55-65, 68 and 69 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARTIN ROGERS whose telephone number is (571)270-7002. The examiner can normally be reached on Monday through Friday, 9:00 to 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on 571-272-1226. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Martin Rogers/

/Richard Crispino/
Supervisory Patent Examiner, Art Unit 1747